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SESSION ID: CTF-T09

Cloud CTF 201: Solving Capture-The-Flag Challenges in AWS, Azure, GCP

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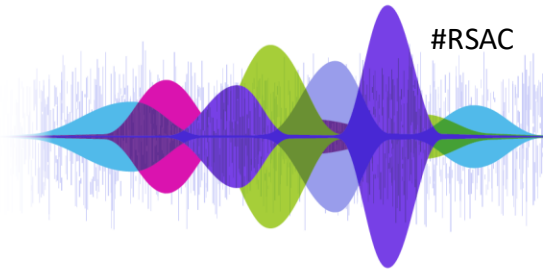

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MEET THE TEAM

> WHOAMI

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One Community.

Meet the team

Jenko Hwong

linkedin: jenkohwong

- Cloud threat research, products and engineering
- Vulnerability management, pen-testing, threat intel, AD security
- Contributor Cloud Village CTF

Luis Rivas

GitHub: G0TH3R

- Cybersecurity Researcher and experienced Red Teamer
- Works, learns, and mentors @ Cloud Village
- Over 10 years working with IT, Cybersecurity, and hacks

Agenda

What are we doing here?

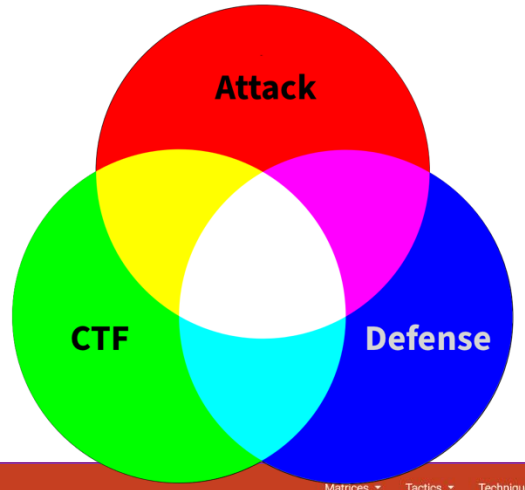
→ Introduction: Meet The Cloud Threat

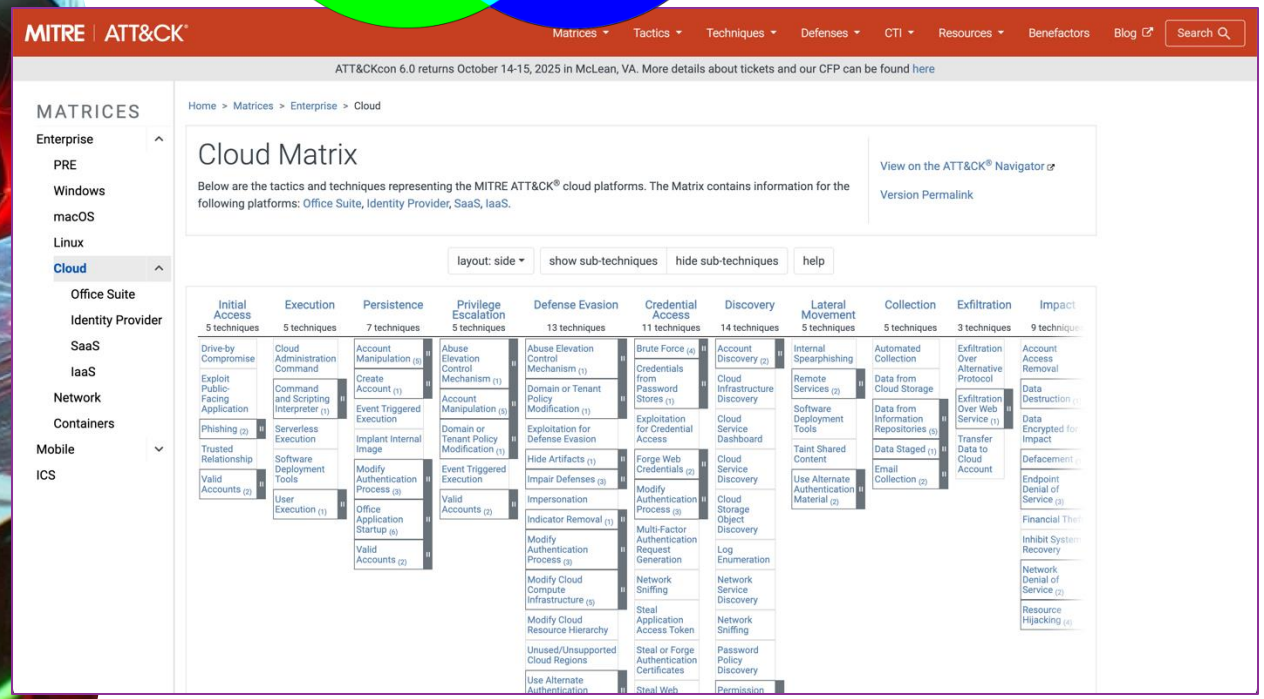
→ Set your env

→ Solving the Challenge

→ Apply what you learned!

Meet the Cloud Threat





Using a common framework

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AWS

Threat Actor:
APT-909 "Nebula Specters"

Cloud-native adversary targeting DevOps pipelines, cloud IAM misconfigurations, and ephemeral credentials.

Tactics & Techniques:

- **T1087.004** - Cloud Account Discovery
- **T1552.005** - Unsecured Credentials in Instance Metadata Service
- **T1078.004** - Cloud Accounts with Misconfigured Role Assumption

Objective:

(C) Persistence & Data Exfiltration from AWS

Set your environment

env

```
→ curl https://github.com/cloud-village/rsac-2025-lab

→ Instructions to start your journey: $M4NAG3R or $H4CK3R
```

CHOOSE YOUR ADVENTURE

Solving the Challenge: AWS

→

→

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→ AWS Challenge << EOF > solution.md

BLOG // TECH // SEP 13, 2022
Introducing: CloudFox
By: Seth Art, Alumnus Principal Security Consultant & Carlos Vendramini, Bishop Fox Alumnus
cloudfox

Choose your Tools!

~ Exploiting EC2 Instance Metadata for Temporary Credentials

→ cat AWS_Challenge_1.txt

→ **Scenario:** A misconfigure EC2 instance allows APT 909 metadata service (IMDSv1) access.

→ **Goal:** Extract Temporary AWS Credentials.

→ Technique: Abuse EC2 Metadata API

Defensive Measures:
Enforce IMDSv2, restrict IAM roles, monitor VPC Flow Logs

→ cat AWS_Challenge_2.txt

→ **Scenario:** The attacker gains access to an IAM user token from a compromised developer's laptop.

→ **Goal:** Extract AWS account details and discover privilege escalation paths.

→ Technique: Enumerate IAM Roles & Permissions

Defensive Measures:
CloudTrail logging, IAM least privilege, GuardDuty alerts.

~ Privilege Escalation and Data Exfiltration

→ cat AWS_Challenge_3.txt

→ **Scenario:** The attacker finds an overprivileged IAM role that allows sts:AssumeRole and access to S3 bucket.

→ **Goal:** Move laterally by assuming a more privileged role and exfil data.

→ Technique: IAM Role Hijacking and S3 Accessible S3 Buckets

Defensive Measures:
Restrict sts:AssumeRole, enable CloudTrail and bucket monitoring

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GCP

Threat Actor:
UNC-225 "Evil Corp"

Cloud-native adversary targeting DevOps pipelines, cloud IAM misconfigurations, and ephemeral credentials.

Tactics & Techniques:

- **T1486.000** – Data Encrypted for Impact
- **T1552.005** - Unsecured Credentials in Instance Metadata Service
- **T1078.004** - Cloud Accounts with Misconfigured Role Assumption

Objective:

(C) Persistence & Data Exfiltration from GCP

Set your environment

env

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```

CHOOSE YOUR ADVENTURE

```
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→ GCP Challenge << EOF > solution.md
```

~ Supply Chain Attack via Cloud Build Poisoning

→ cat GCP_Challenge_1.txt

→ **Scenario:** A DevOps pipeline in Cloud Build is injected with malicious artifacts.

→ **Goal:** Inject a backdoored artifact into Cloud Build to gain access.

→ Technique: Cloud Build Privilege Escalation & Artifact Poisoning

Defensive Measures:

- Monitor for unauthorized Cloud Build Modifications
- Limit Cloud Build to only necessary permissions
- Enforce Binary Authorization to prevent unsigned deployments

~ Escaping a GKE Container to Compromise the Host

→ cat GCP_Challenge_2.txt

→ **Scenario:** A **cluster** allows attackers to **escape and** gain **host-level.**

→ **Goal:** Exploit **GKE misconfigurations** to escape a container and execute commands on the underlying host.

→ Technique: Kubernetes privilege Escalation + Escape to Host

Defensive Measures:
Pod Security Policies: Prevent containers from running as root.
Restrict Kubernetes RBAC: Ensure least privilege
Cloud Logging: Monitor unusual Kubernetes API calls

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Azure

Threat Actor: Storm-2025 "Rosa Klebb"

Cloud-native adversary targeting OAuth tokens, service principals, and native services.

Tactics & Techniques:

- **T1550.001** – Application Access Token
- **T1556.009** – Conditional Access Policies
- **T1078.004** - Cloud Accounts

Objective:

(C) Defense Evasion & Persistence

Set your environment

env

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→ Instructions to start your journey: $M4NAG3R or $H4CK3R
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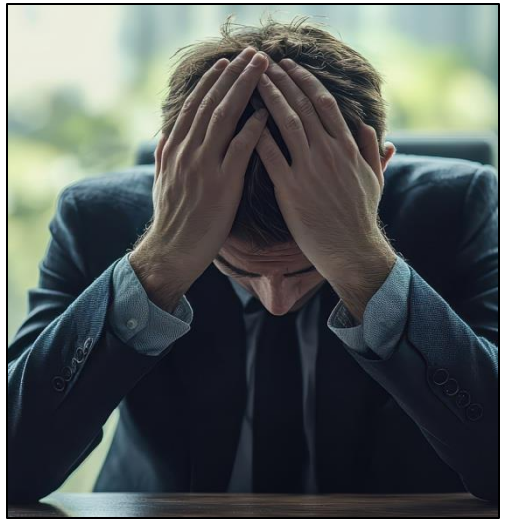

CHOOSE YOUR ADVENTURE

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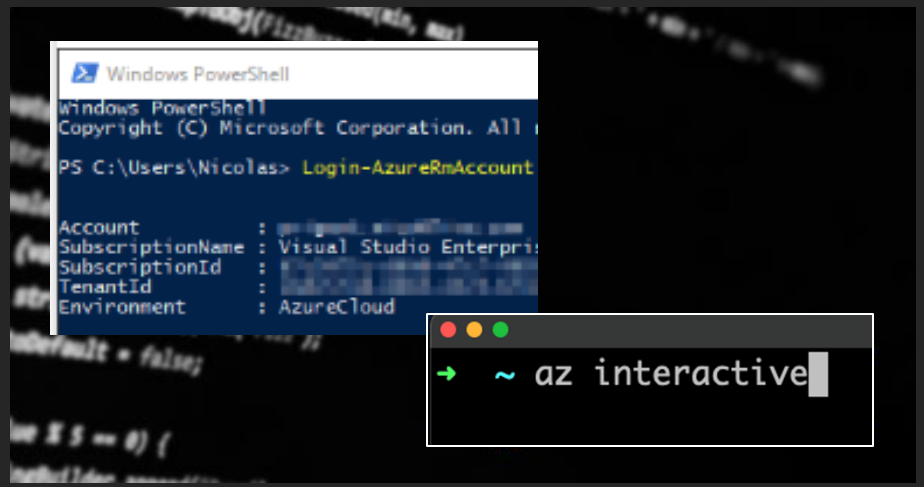
→ Azure Challenge << EOF > solution.md



Choose your Tools!

~ Privilege Escalation and Data Exfiltration

→ cat Azure_Challenge_1.txt

→ **Scenario:** Weak authentication policies lead to session hijacking and access.

→ **Goal:** Enumerate users, password-spray, discover targets, spear-phish.

→ Technique: Use enumeration and password spray, MSGraph calls, and device code phish.

Defensive Measures:
Entra ID hardening, user types, MFA, and Conditional Access.

~ Privilege Escalation and Data Exfiltration

→ cat Azure_Challenge_2.txt

→ **Scenario:** Service principals allow privilege escalation.

→ **Goal:** Exploit App Administrator access to gain control of an SP.

→ Technique: az ad sp, aadinternals

Defensive Measures:
Restricted roles, strong SP auth, Azure log monitoring.

~ Privilege Escalation and Data Exfiltration

→ cat Azure_Challenge_3.txt

→ **Scenario:** Post access, you want to install backdoors for persistence.

→ **Goal:** Use temporary delete status, Cloud Shells, service principals, and Serverless functions for persistence.

→ Technique: custom

Defensive Measures:
Restricted roles, strong SP auth, Azure log monitoring.

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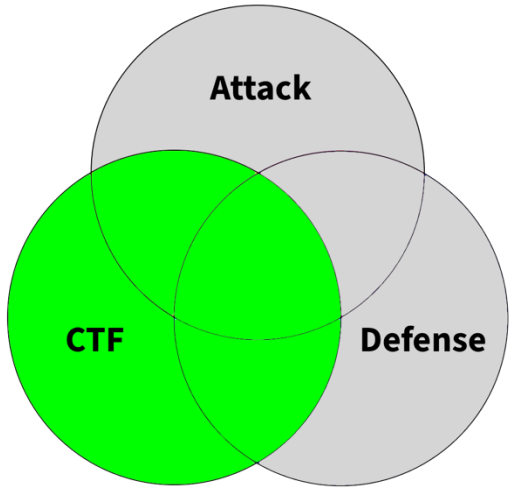
Learnings

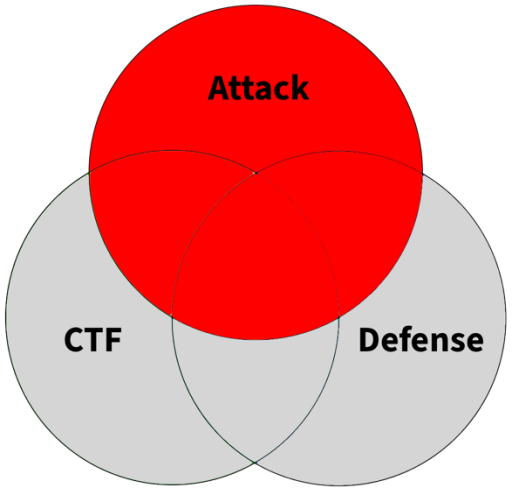
“Apply” CTF in Life

- CTF is a playground
  - Sharpen your skills in CTFs
  - Seek out and share knowledge
  - Have fun and learn
- The office is the battleground
  - Map to real red-team techniques
  - Anticipate defensive measures as you solve challenges
  - Teamwork



“Apply” the Adversarial Perspective

- The ignored attack chain
  - Enumeration and discovery are ignored
  - Persistence is not just a good red-team trait
  - Cloud log evasion and confusion
- Techniques
  - Session tokens are a gift that keeps giving
  - Confused identities are an opportunity
- “Know thy adversary”
  - IPs, domains, URLs – exploit the trust and hide in the noise
  - Posture/config, MFA, conditional access, primary credentials



“Apply” Defense in Depth

- Cybersecurity is everyone’s realm

  Protect it.

- Learn more about attacks – Understand how to defend

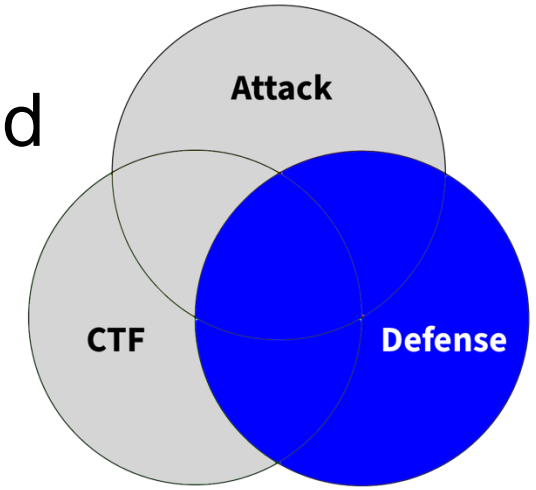
  Zero Trust will not defend itself.

- Analyze broadly

  Implement incrementally.

- Some defense is better than NO Defense

  You are ready.



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Resources

Code and Explanations

- https://github.com/cloud-village/rsac-2025-lab

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README.md
Technical_Notes.pdf
Solutions.pdf
AWS/
Azure/
GCP/
Tools/
```

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